

Committees: Corporate Projects Board [for decision] Projects Sub [for decision] Planning and Transportation Committee [for decision] Markets Committee [for information]	Dates: 11 November 2020 30 November 2020 Urgency 25 November 2020
Subject: Lindsey Street Bridge Strengthening Unique Project Identifier: 12239	Gateway 2: Project Proposal Regular
Report of: Director of the Built Environment Report Author: Jagdeep Bilkhu	For Decision
<h1>PUBLIC</h1>	

Recommendations

1. Next steps and requested decisions	<p>Project Description: Strengthening of the structure to meet the load carrying capacity of current standards and to undertake any other remedial works that would benefit the structural integrity and longevity.</p> <p>Next Gateway: Gateway 3/4 - Options Appraisal (Regular)</p> <p>Next Steps: Options study to be completed presenting solutions for strengthening and any further recommendations. Carry out any surveys or investigations to fill any “gaps” in information still required.</p> <p>Requested Decisions:</p> <ol style="list-style-type: none"> 1. That a budget of £100,000, of which £70,000 has been secured from the London Bridges Engineering Group (LoBEG), is approved to reach the next Gateway, by supplementation from the On-Street Parking Reserve. 2. Note the total project budget of £2,500,000 (excluding risk);
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2. Resource requirements to reach next Gateway	Item	Reason	Funds/ Source of Funding	Cost (£)
	Consultant Fees	Develop options for strengthening	London Bridges Engineering Group (LoBEG)	40,000*
	Staff Costs	Project Management of consultants and further investigations/ surveys. Liaisons with internal stakeholders.	LoBEG	10,000*
	Investigations, surveys etc.	Provide information that is still missing or ambiguous for the options study and ultimate the design of these works.	LoBEG	50,000 Not confirmed.
	Total			100,000
<p>* The sum of £70k (£40k consultant fees, £10k staff costs and £20k for investigations/surveys) has been awarded by LOBEG to fund this scheme and an additional £30k has been bid for. The outcome of the £30k bid will be known next year.</p> <p>If the bid to LOBEG for £30k, which is required to reach the next Gateway, is unsuccessful a drawn-down from the On-Street Parking Reserve is proposed and has already been discussed with the Chamberlain's department. The funding has been agreed in principle subject to Resource Allocation Sub Committee approval in December 2020.</p>				
3. Governance arrangements	<ul style="list-style-type: none"> • Service Committee responsible for this project shall be Transportation and Planning Committee. This report will also be presented to Projects Sub Committee. • The Senior Responsible Officer is Paul Monaghan (Assistant Director Engineering). 			

- A project board is not required for this project.

Project Summary

4. Context

- 4.1 This structure has undergone major structural modification as a result of the Crossrail Farringdon East Station escalator tunnel barrel which is now situated within a few metres of the bridge foundations at the closest points. Crossrail undertook compensation grouting around the escalator tunnel to improve the ground conditions and constructed a reinforced concrete raft slab under some of the arches so the bridge could be raised on jacks as a settlement prevention measure. This was a complex operation and is now completed on site. There are however, some remaining issues that have been brought to the attention of Crossrail with respect to the work that they carried out which are not the subject of this report.
- 4.2 During the Crossrail works, it was confirmed that the structure is not a series traditional backfilled masonry arches. In the structures current state, load from the jack-arch structure is transferred to the masonry arches by virtue of 'spinal' walls, also constructed of masonry under each of the jack-arch girders bearing on the spine walls and in turn these walls on to the main masonry arch.
- 4.3 A diagrammatic representation of the elevation showing jack-arch girders above the new masonry arch in two of the spans is shown in Appendix 2.
- 4.4 As a consequence of the above, a bid for funding was made to Transport for London through the London Bridges Engineering Group (LoBEG) to allow a structural assessment to be commissioned along with intrusive investigations to current highway standards.
- 4.5 It was found that one of the spans had jack-arches replaced with precast concrete planks spanning between the jack-arch girders over a limited area of that particular span. It is not known why these concrete planks were installed but it is suspected to be repair from bomb damage of WWII.
- 4.6 In 2018 funding was awarded by LoBEG and a structural assessment completed and reported in August 2019. The results of this assessment confirmed that the structure was not capable of carrying full Assessment Live Loading (ALL) to current standards, limited by the strength of the precast concrete planks to vehicles of gross weight 7.5 tonnes only.
- 4.7 The structure has since been the subject of close visual inspection for any changes in condition. Both the

	<p>highways division and Markets have been made aware of the current situation.</p> <p>4.8 A further award of limited funding was granted by LoBEG, to commence an options study for strengthening in June 2020.</p>
5. Brief description of project	5.1 Strengthening of a multi-span (non-traditional) masonry arch structure over various property, including London Underground railway.
6. Consequences if project not approved	<p>6.1 The clear and obvious consequence from the structural assessment of 2019 is that weak elements have been identified and that there is the potential for these to collapse if they continue to be overloaded. If these elements do collapse, it will mean that the entire highway would need to be closed to vehicular traffic due to the location of these elements within the carriageway.</p> <p>6.2 Should any failure of the weak elements affect the main masonry arch structure, there is the potential that operation of railway services or whatever activity is currently being undertaken underneath the arches could be affected and ultimately need to be stopped.</p> <p>6.3 The new Farringdon East Station and new office building on the oversight of the station have resulted in new public realm works, including footway improvement and kerb realignment. There could be disruption to this building and station.</p>
7. SMART project objectives	<p>7.1 Meeting statutory obligations by strengthening/replacing the failing elements of the structure to meet current loading standards.</p> <p>7.2 Removal of any increased management and/or interim measures that may be required.</p> <p>7.3 Removal of Corporate liabilities associated with being an asset owner and manager.</p>
8. Key benefits	<p>8.1 Potential to remove the inability to inspect non-visible elements, depending on the options selected, either by backfilling completely or by introducing inspection chambers.</p> <p>8.2 Enabling the structure to be able to sustain loading to current highway standards.</p>
9. Project category	2. Statutory
10. Project priority	A. Essential
11. Notable exclusions	11.1 This scheme does not involve any remedial work to Span 1 of the multi-span structure. Span 1 carries

	Lindsey Street over the London Underground, Metropolitan and Circles Lines. The form of construction of Span 1 is thought to be a traditional backfilled masonry arch, different to the other non-traditional arches of spans 2, 3 and 4, which were originally constructed using jack-arches supported on steel columns.
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Options Appraisal

12. Overview of options	<p>12.1 The 'Do Nothing' option is not feasible. Physical interim measures (to avoid loading the understrength parts of the structure) cannot be implemented due the location of the understrength elements which are across the middle of the existing carriageway, strengthening of the structure is a necessity.</p> <p>12.2 Replace the elements that are under capacity, in that one span only and undertake localised strengthening and reinstatement, including localised waterproofing.</p> <p>12.3 Strengthen the entire span with the understrength elements and re-waterproofing of that span only.</p> <p>12.4 Strengthen spans 2, 3 and 4, including re-waterproofing of the entire structure.</p>
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Project Planning

13. Delivery period and key dates	<p>Overall project: 6-12 months depending on the option selected for construction.</p> <p>Key dates:</p> <p>G3-4 Spring/Summer 2021</p> <p>G5 late 2021</p> <p>G6 late 2022 (provided this report can be presented to Members before the contractual requirement of the end of the defects correction period or equivalent).</p> <p>Other works dates to coordinate: This scheme is not planned to be coordinated with any other works however it is known that Farringdon East Station is not currently open to the general public and is anticipated to be opening late 2021 provided there are no further delays to Crossrail.</p> <p>As part of the new station works there is a project to improve the public realm in this area, including re-surfacing of the highway. Lindsey Street Bridge Strengthening scheme is already working in liaison with the team coordinating the Farringdon East (Crossrail) Highway Reinstatement scheme.</p>
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	<p>We are also aware that works on the new Museum of London will be commencing in the Smithfield area from the start of 2021. There is likely to be construction activity from this scheme in the area too.</p>
14. Risk implications	<p>Overall project risk: Medium</p> <p>Some of the envisaged risks are:</p> <ul style="list-style-type: none"> • Potentially finding that the structural arrangement is different to that assumed during construction. Consequently, elements that have been assumed to be capable of carrying 40 tonnes assessment live load may need strengthening/replacement. • Unknown services and buried plant or the aforementioned not being in the envisaged location. <p>Risk Provision is not required to reach the next gateway. A risk register showing Costed Risk Provision is currently under development.</p>
15. Stakeholders and consultees	<p>Internal</p> <p>15.1 Smithfield Market</p> <p>15.2 City Surveyor's Department</p> <p>15.3 Finance</p> <p>15.4 Procurement</p> <p>External</p> <p>15.5 Transport for London</p> <p>15.6 Crossrail</p> <p>15.7 London Bridges Engineering Group (LoBEG)</p> <p>15.8 Market traders</p>

Resource Implications

16. Total estimated cost	<p>Likely cost range (excluding risk):</p> <p>£500,000 - £2,500,000 depending on the option selected for strengthening.</p> <p>Likely cost range (including risk):</p> <p>A risk register is currently being developed in conjunction with our consultant and will be presented with the G3/4 report. At the present time, no risk allowance is required to reach the next gateway.</p>
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17. Funding strategy	Choose 1: Partial funding confirmed	Choose 1: Mixture - some internal and some external funding										
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18. Investment appraisal		N/A										
19. Procurement strategy/route to market	<p>19.1 We would recommend that design services are carried out by out term consultant for engineering services, Arcadis. They have also conducted the structural load assessment as well as coordinated the intrusive investigations and have therefore accrued some intimate knowledge of the structure.</p> <p>19.2 The appointment of a main contractor for the construction of the strengthening works is likely to come through a tender process. Once the design is complete and a better indication of the estimated cost is known, we will consult with procurement for the best route to market.</p> <p>19.3 All appointments will be made in line with the City's Procurement code.</p>											
20. Legal implications	<p>20.1 The City of London Corporation have a duty of care to maintain the highway. As highway authority and owner of this structure that supports the highway, there is also a duty to keep the supporting structure in a good state of repair.</p>											
21. Corporate property implications	<p>21.1 Loading bays on Lindsey Street would not be in service during the construction stage to strengthen the structure. There is a high probability that all the bays will be taken out of service and therefore Smithfield Market would not be able to use them for loading/unloading.</p>											

	<p>21.2 The proposals in this report meet key objectives of the Corporate Property Asset Management Strategy;</p> <ul style="list-style-type: none"> Operational assets remain in a good, safe and statutory compliant condition. Operational assets are fit for purpose and meet service delivery needs.
22. Traffic implications	<p>22.1 This will be assessed as part of the selection process as the implications will be different for each option, It should be noted that all options will have some implications but the worst case scenario of no works and weight restrictions to protect the bridge is the worst case.</p> <p>22.2 There may be an effect of serving the new Farringdon East Station and office building with taxis etc.</p>
23. Sustainability and energy implications	None.
24. IS implications	None.
25. Equality Impact Assessment	An equality impact assessment will not be undertaken.
26. Data Protection Impact Assessment	The risk to personal data is less than high or non-applicable and a data protection impact assessment will not be undertaken

Appendices

Appendix 1	Project Briefing
Appendix 2	Plan and Elevations of the Structure

Contact

Report Author	Jagdeep Bilkhu
Email Address	jagdeep.bilkhu@cityoflondon.gov.uk
Telephone Number	020 7332 1544